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ABSTRACT

Reading is a skill that can complement a hands-on approach in learning relevant facts, concepts, and generalizations pertaining to different units of study. Teachers should guide students to have the ability to identify unknown words prior to their actual reading of subject matter in science. Pupils tend to make minimal mistakes in word recognition when teachers introduce assumed unknown words prior to the actual reading of content. Prior to reading science content, teachers should use pictures or other audio-visual materials to assist learners to secure background information. Science teachers should always notice the kinds of errors pupils make in reading. The following kinds of pupil errors in reading science content should be evaluated by the teacher: mistakes made in sound/symbol relationships in reading; weaknesses noticed in pupils not being able to divide words into syllables; and difficulties in using context clues. Pupils should reflect upon subject matter encountered and develop their problem-solving skills. Reading, along with other activities and experiences, should provide a variety of endeavors to secure pupil interest. (RS)

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READING IN SCIENCE

1994

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Reading in the curriculum area of science is vital. it is a way of identifying problems within the context of reading. Reading can also be an approach used to develop an hypothesis as well as test hypotheses. Reading is a skill that can complement a hands on approach in learning relevant facts, concepts, and generalizations pertaining to different units of study.

There are definite methods that science teachers should use to guide student reading in ongoing lessons of study.

Guiding Science Reading

I have supervised student teachers in public schools for thirty years and have observed what appears to assist learners to achieve well when engaging in reading activities in science. These student teachers guided learners to be able to identify unknown words prior to their actual reading of subject matter in science. Possible new words to be encountered by students in reading science content were printed in neat manuscript letters on the chalk board. A few student teachers would print the possible unknown words within a sentence framework. In either case, the student teacher would observe pupils to see that they looked at each word being introduced carefully. Sometimes, the student teacher showed a picture or object directly related to the new word printed on the chalk board. Meaningful learning is very important. Thus, pupils should understand what is read and taught. This was in further evidence when the student teacher had pupils use the new words in sentences. If necessary, the student teacher would use the new word in a sentence that would harmonize with the content to be read in the science textbook(s).

Pupils tended to make minimal mistakes in word recognition when the student teacher introduced assumed unknown words to pupils prior to

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the actual reading of content. I believe strongly that pupils who do well in science should be equally. proficient readers also. Scientists in a laboratory setting are good readers since this is an important way of acquiring needed information. The teaching of science is not a reading course, but pupils need direction to identify needed words so that necessary subject matter can be found in a problem solving situation. When words are introduced to pupils prior to the actual reading of content, learners sometimes make interesting discoveries such as words that are antonyms or synonyms. Vocabulary growth and development are important in reading science materials.

Prior to reading science content, the teacher should use pictures or other audio- visual materials to assist learners to secure background information. The necessary background information guides pupils to attach meaning to subject matter read. Pupils should not be word callers. They must understand what has been read. Using visuals or real objects that directly relate to the facts, concepts, and generalizations read will help pupils to understand abstract words encountered. I find that learners very frequently identify problem areas when viewing the pictures which make the abstract comprehendible. These problem areas then provide reasons for reading. Reading is then done to secure answers/ hypothesis to identified problems. Additional learning activities will be needed so that pupils develop reasonable hypotheses to problem areas. Experimentation should be the heart of the science curriculum with reading subject matter as another related avenue of learning.

After learners have completed the reading activity for the designated lesson, they may then pursue follow up experiences. Thus, pupils might use seminar methods to discuss in depth the subject matter read as well as the results of other learning activities. The seminar stresses depth, not survey learning.

Science teachers should always notice the kinds of errors pupils make in reading. Diagnosis is then in evidence. The following kinds of pupil errors in reading science content should be evaluated by the teacher;

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1. mistakes made in sound/symbol relationships in reading. The science teacher might then provide pupils with help in phonics as it is needed to understand content read.

2. weaknesses noticed in pupils not being able to divide words into syllables so that each word is identified in a meaningful manner. There are common prefixes and suffixes which pupils may learn to recognize that have much transfer value from one situation to the next, e.g. "un" for a prefix and "ful" for a suffix. Once a word has been divided into meaningful parts, a pupil may almost immediately identify the unknown due to knowing the pronunciation of selected parts, e. g. not being able to identify the word "uneasy." However, when the pupil divides "uneasy" into component parts, he/she recognizes "un" and "easy." The two syllables are then blended to pronounce correctly the word "uneasy."

3. difficulties in using context clues. If a pupil does not recognize a word when reading science content, the teacher should ask learners to provide a word that fits in with the other words in the sentence. Too frequently, pupils provide a guess that is ridiculous for the unknown word. Certainly, pupils should provide a word that at least makes sense in relationship to the surrounding words in the sentence.

Higher Levels of Cognition

Pupils should reflect upon subject matter encountered. To reflect requires thought. Thus pupils should think critically pertaining to ideas gleaned. When pupils think critically, they separate fact from opinion, fantasy from reality, and the relevant form the irrelevant. Learners may also detect content errors while reading. Pupils then must reflect upon the subject matter read so that understanding and concentration are in evidence. Also, learners will retain content longer if reflection upon ideas obtained is emphasized. A good science teacher realizes that pupils need to become good readers since reading is one avenue of learning, among others.

Higher levels of cognition also require that pupils think creatively pertaining to ideas obtained. With, creative thinking, pupils secure

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originality of ideas. Uniqueness and novelty of response are salient in the creative thinking domain.

Problem solving procedures as skills are vital for all pupils to develop. To solve problems, pupils need to be curious individuals who have a desire to learn. Reading is one way to obtain necessary information to solve problems. Thus to solve problems, pupils need to identity a problem area, develop an hypothesis, test the hypothesis, and revise the hypothesis if needed. In each step of problem solving, learners may read from the science textbook or/and tradebooks e.g. pupils might identify one or more problems in science through reading. Generally, additional learning activities will be in the offing so that pupils may select and solve problems in depth rather than use survey approaches.

In Conclusion

A quality program of reading in science stresses learners acquiring vital facts, concepts, and generalizations in ongoing lessons and units of study. Reading, along with other activities and experiences, should provide a variety of endeavors to secure pupil interest. Various endeavors also guide the science teacher in providing for individual differences in the classroom so that each pupil might learn as much as possible.

Reading in science needs to emphasize higher levels of cognition. Thus pupils develop skills in critical and creative thinking as well as in problem solving. Learners need to achieve optimally in science. The world of science surrounds everyone and has made for inventions and technology that truly are outstanding and revered.

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